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(54) Title: HSP70 FROM ARTHROBACTER

(57) Abstract: The hsp70 gene from an Arthrobacter species has been isolated and sequenced. The encoded protein is believed to be highly immunogenic, especially in fish, and also has utility as a non-specific adjuvant, and as an adjuvanting carrier for heterologous antigens.

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Internation Population No

PCT/EP 03/07602 A. CLASSIFICATION OF SUBJECT MATTER IPC 7 CO7K14/305 A61K39/02 A61K39/12 C12N15/31 C12N15/62 C07K16/12 A61K48/00 According to International Patent Classification (IPC) or to both national classification and IPC B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) IPC 7 - C07K - A61KDocumentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practical, search terms used) WPI Data, EMBASE, EPO-Internal, BIOSIS, SEQUENCE SEARCH, PAJ C. DOCUMENTS CONSIDERED TO BE RELEVANT Category ' Citation of document, with indication, where appropriate, of the relevant passages Relevant to claim No. WO 01 29233 A (HUNG CHIEN FU ; WU TZYY X 1-5,7-25 CHOOU (US); UNIV JOHNS HOPKINS MED (US)) 26 April 2001 (2001-04-26) page 2 -page 3; figure 20 X WO 02 04018 A (UNIV COLORADO RES ; BELISLE 1-3, 7-11, JOHN T (US); ORME IAN M (US)) 17 January 2002 (2002-01-17) 16-18, 21, 23-25,28 **SEQ ID NO:15** page 18; table 1 X > WO 01 68865 A (BROUWERS HUUB ; JONES SIMON 3,7,8, (CA); GRIFFITHS STEVE (CA); SIMARD NATH) 11, 20 September 2001 (2001-09-20) 16 - 1821,24-27 page 12 -page 13; figure 18 X Further documents are listed in the continuation of box C. Patent family members are listed in annex. Special categories of cited documents: 'T' later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the "A" document defining the general state of the art which is not considered to be of particular relevance Invention "E" earlier document but published on or after the international "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such docu-ments, such combination being obvious to a person eldied in the art. "O" document referring to an oral disclosure, use, exhibition or other means document published prior to the international filling date but later than the priority date claimed *&* document member of the same patent family Date of the actual completion of the international search Date of mailing of the international search report 07/01/2004 19 December 2003

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INTERNATIONAL SEARCH REPORT

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		1/EP 03/0/602
(Continu	ation) DOCUMENTS CONSIDERED TO BE RELEVANT Citation of document, with Indication, where appropriate, of the relevant passages	Relevant to claim No.
X	NEWPORT G R: "HEAT SHOCK PROTEINS AS VACCINE CANDIDATES" SEMINARS IN IMMUNOLOGY, W.B. SAUNDERS COMPANY, PA, US, vol. 3, no. 1, 1991, pages 17-24, XP000881857 ISSN: 1044-5323 the whole document	1-3, 9-11, 16-18, 23-25,30
x	GUDDING R ET AL: "Recent developments in fish vaccinology" VETERINARY IMMUNOLOGY AND IMMUNOPATHOLOGY, AMSTERDAM, NL, vol. 72, 1999, pages 203-212, XP002968601 ISSN: 0165-2427 page 205 -page 209	4-8, 18-20, 25,26
x	WO 01 10469 A (RITCHIE RACHEL JANE; GRIFFITHS STEVEN (CA); AQUA HEALTH EUROP LTD) 15 February 2001 (2001-02-15) cited in the application page 1 -page 11	15, 18-20, 23-26
X	KUZYK M A ET AL: "An efficacious recombinant subunit vaccine against the salmonid rickettsial pathogen Piscirickettsia salmonis" VACCINE, BUTTERWORTH SCIENTIFIC. GUILDFORD, GB, vol. 19, no. 17-19, 21 March 2001 (2001-03-21), pages 2337-2344, XP004231046 ISSN: 0264-410X the whole document	27
X	US 5 858 773 A (MAZODIER PHILIPPE ET AL) 12 January 1999 (1999-01-12) the whole document	29
Α	WO 98 33884 A (GRIFFITHS STEVEN GARETH; SALONIUS KIRA (CA); AQUA HEALTH EUROP LTD) 6 August 1998 (1998-08-06) the whole document	18-20, 25-27
A	KOCH C ET AL: "16S RDNA STUDIES ON MEMBERS OF ARTHROBACTER AND MICROCOCCUS: AN AIDFOR THEIR FUTURE TAXONOMIC RESTRUCTURING" FEMS MICROBIOLOGY LETTERS, AMSTERDAM, NL, vol. 123, no. 1/2, 1994, pages 167-171, XP002066096 ISSN: 0378-1097 page 168, right-hand column, paragraph 2 page 170, left-hand column, paragraph 2	1-29

Form PCT/ISA/210 (continuation of second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Information on patent family members

Internation pplication No PCT/EP 03/07602

Patent document		Publication		Patent family	Publication
dted in search report		date		member(s)	date
WO 0129233	Α .	26-04-2001	AU	2299401 A	
			CA	2388045 A	
			CN	1411512 T	
			EΡ	1222289 A	2 17-07-200
			MO	0129233 A	2 26-04-200
WO 0204018	Α	17-01-2002	AU	7196301 A	21-01-200
			WO	0204018 A	
WO 0168865	Α	20-09-2001	AU	4079101 A	24-09-200
			CA	2402718 A	1 20-09-200
			DK	200201270 A	03-02-200
			ΕP	1282710 A	
			wo	0168865 A	
			NO	20024322 A	
			ÜS	2003138446 A	
WO 0110469	Α	15-02-2001	AU	6304100 A	05-03-200
NO 0110105	••	10 02 2001	CA	2378437 A	
			DK	200200167 A	
			EP	1200132 A	
			WO	0110469 A	
			NO	20020573 A	
US 5858773	A	12-01-1999	FR	2666588 A	1 13-03-199
00 0000770	••	12 01 1333	ÜŜ	6153404 A	
•			AT	127522 T	
			CA	2090010 A	
			CN	1059935 A	
			DE	69112834 D	
			DK	548175 T	
			EP	0548175 A	
			ES	2078543 T	
			WO ES	2076543 1 9204452 A	
			GR	3017913 T	
				3017913 I 64396 A	
			HU		
			ΗU	219394 8	
			IL	99439 A	
			JP	5506581 T	
			KR	219344 B	1 01-10-199
WO 9833884	Α	06-08-1998	AU	5773998 A	
			EP	1012230 A	
			WO	9833884 A	.1 06-08-199
			US	6627203 B	1 30-09-200